Munich Cancer Registry

- Survival
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- *Deutsch*

ICD-10 D00-D09: In situ neoplasms

Incidence and Mortality

Year of diagnosis	1998-2020
Patients	43,041
Diseases	45,390
Creation date	12/21/2021
Database export	12/20/2021
Population	4.95 m

Munich Cancer Registry
Cancer Registry Bavaria - Upper Bavaria Regional Center
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Marchioninistr. 15
Munich, 81377
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https://www.tumorregister-muenchen.de/en

https://www.tumorregister-muenchen.de/en/facts/base/bD0009E-ICD-10-D00-D09-In-situ-neoplasms-incidence-and-mortality.pdf

Index of figures and tables

Global Statements about the statistics on the Internet −
Baseline Statistics (grey button), **Survival** (red button)

In these analyses, the clinics and physicians of Upper Bavaria and the city and county of Landshut[#], with a total of 4.69 million inhabitants, account for the frequency of cancer diseases[##] and the achieved long term results. Additionally, the long term survival evaluated by the Munich Cancer Registry (MCR) is compared with the results of the population-based registry in the USA (SEER), which is useful for checking the consistency of the data on an international level.

In comparing several tables, inconsistent figures may be detected. This is based on the fact that different patient cohorts are included in the base calculation, for example when proportions of multiple tumors or DCO-cases[###] are concerned. In other cases the individual tumor diagnosis is the basis for calculation, for example with incidence.

The foot notes describe the currentness of the data. The baseline statistics and survival data are updated annually. This yearly analysis comprises the Annual Report of the MCR.

Clinics and physicians have access to essentially more detailed data, with which they can check, compare and in the best case optimize their own data and results.

We would be pleased to receive corrections, critique and useful suggestions. Just send an e-mail to tumor@ibe.med.uni-muenchen.de.

Munich Cancer Registry, December 2021

[#] Base data has been collected since 1998. An increase in new diseases is apparent, which is an effect of two extensions in the MCR catchment area (from a base population of 2.65 million to 4.10 in 2002, and to 4.69 million in 2007).

[##] Due to the high frequency and good prognosis of non-malignant skin cancer (C44), no systematic ascertainment is performed for this diagnosis. C44 is not designated as a primary, but rather as a secondary tumor.

[###] DCO (death certificate only) identifies a cancer case that first becomes available to the MCR through the death certificate.

ICD-10 codes (ICD-10 2016) used for specifying cancer site

Code	Description
D00.-	Carcinoma in situ of oral cavity, oesophagus and stomach
D01.-	Carcinoma in situ of other and unspecified digestive organs
D02.-	Carcinoma in situ of middle ear and respiratory system
D03.-	Melanoma in situ
D04.-	Carcinoma in situ of skin
D05.-	Carcinoma in situ of breast
D06.-	Carcinoma in situ of cervix uteri
D07.-	Carcinoma in situ of other and unspecified genital organs
D09.-	Carcinoma in situ of other and unspecified sites

INCIDENCE

Table 1

Cases by year of diagnosis, proportions of further malignancies, deaths, and active follow-up (ALL PATIENTS)

Year of diagnosis	All cases n	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	578	14.4	19.4	55.0	95.2
1999	630	15.1	19.3	52.9	95.7
2000	652	15.5	19.1	52.0	94.9
2001	669	16.6	18.8	46.6	94.2
2002	1047	17.1	18.7	49.7	95.3 #
2003	1188	17.0	18.3	43.4	93.9
2004	1585	17.1	18.1	43.1	94.1
2005	1689	17.7	17.6	40.4	93.4
2006	1722	18.2	17.1	37.0	90.0
2007	2116	18.7	16.6	37.3	87.7 #
2008	2315	19.2	16.0	32.2	97.2
2009	2485	19.7	15.5	31.1	96.5
2010	2832	20.4	14.8	28.1	96.4
2011	2853	20.6	14.1	24.6	96.7
2012	2916	21.2	13.6	25.4	96.9
2013	3309	21.6	12.8	21.7	95.6
2014	2921	22.2	11.9	23.3	92.8
2015	2425	22.7	10.8	18.6	90.4
2016	2354	23.1	9.8	15.4	98.8
2017	2220	23.4	8.5	13.7	99.5
2018	2424	24.1	7.0	10.4	99.1
2019	2497	24.5	5.1	7.1	99.1
2020	1963	24.6	3.0	3.8	99.4 ##
1998-2020	45390	24.6	19.4	26.2	95.6

45,390 cases diagnosed 1998-2020 are related to a total of 43,041 patients. Currently, in 15,890 (36.9 %) of these 43,041 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 10,613 / 3,344 / 1,933 (24.7 % / 7.8 % / 4.5 %) patients exist having 2 / 3 / 4+ malignancies.

\# The increases of incident cases in 2002 and 2007 reflect the expansion to additional registry areas.

\## Please be aware that data of recent annual patient cohorts may not yet be fully processed. The years under evaluation can be retreived from the respective headings.

How to interpret:
In 2018, a subgroup of 2,424 cases has been diagnosed, of which 24.1 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 7.0 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 1a

Cases by year of diagnosis, proportions of further malignancies, deaths, and active follow-up (MALES)

Year of diagnosis	Males n	Males %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	278	48.1	12.6	26.5	69.1	95.7
1999	307	48.7	14.7	26.4	63.2	97.4
2000	305	46.8	15.7	26.3	64.6	96.7
2001	289	43.2	17.0	26.0	64.4	97.2
2002	481	45.9	18.1	25.9	63.0	97.5 #
2003	537	45.2	18.0	25.6	59.8	95.5
2004	683	43.1	19.0	25.4	59.2	95.5
2005	708	41.9	20.3	24.9	57.6	93.9
2006	696	40.4	20.9	24.5	55.5	93.8
2007	875	41.4	21.7	23.9	55.3	93.3 #
2008	869	37.5	23.0	23.4	49.8	98.4
2009	976	39.3	24.3	22.7	47.3	97.5
2010	1133	40.0	25.7	21.9	45.1	97.1
2011	1077	37.7	26.4	20.8	40.5	97.2
2012	1176	40.3	27.5	20.1	40.4	97.4
2013	1272	38.4	28.6	19.0	37.0	96.5
2014	1135	38.9	29.4	17.6	37.7	96.7
2015	962	39.7	30.2	16.2	29.9	93.6
2016	932	39.6	30.8	15.0	24.7	98.7
2017	884	39.8	31.3	13.4	21.9	99.7
2018	1006	41.5	32.2	11.1	15.1	99.0
2019	1030	41.2	32.8	8.4	11.5	99.0
2020	628	32.0	33.2	5.3	8.6	99.5 ##
1998-2020	18239	40.2	33.2	26.5	40.2	96.9

18,239 cases diagnosed 1998-2020 are related to a total of 16,964 patients. Currently, in 8,438 (49.7 %) of these 16,964 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 5,229 / 1,908 / 1,301 (30.8 % / 11.2 % / 7.7 %) patients exist having 2 / 3 / 4+ malignancies.

The increases of incident cases in 2002 and 2007 reflect the expansion to additional registry areas.

Please be aware that data of recent annual patient cohorts may not yet be fully processed. The years under evaluation can be retreived from the respective headings.

How to interpret:
In 2018, a subgroup of 1,006 cases has been diagnosed, of which 32.2 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 11.1 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 1b

Cases by year of diagnosis, proportions of further malignancies, deaths, and active follow-up (FEMALES)

Year of diagnosis	Females n	Females %	Prop. at least 1 further malign. prior + synchron. %	Prop. at least 1 further malign. after %	Prop. deaths %	Prop. actively followed %
1998	300	51.9	16.0	14.8	42.0	94.7
1999	323	51.3	15.6	14.7	43.0	94.1
2000	347	53.2	15.4	14.5	40.9	93.4
2001	380	56.8	16.3	14.3	33.2	91.8
2002	566	54.1	16.3	14.1	38.3	93.5 #
2003	651	54.8	16.1	13.8	30.0	92.6
2004	902	56.9	15.5	13.5	30.9	93.1
2005	981	58.1	15.6	13.0	28.0	93.1
2006	1026	59.6	16.2	12.6	24.6	87.3
2007	1241	58.6	16.4	12.2	24.7	83.8 #
2008	1446	62.5	16.4	11.5	21.6	96.5
2009	1509	60.7	16.4	11.1	20.5	95.9
2010	1699	60.0	16.5	10.5	16.7	96.0
2011	1776	62.3	16.6	10.0	15.0	96.3
2012	1740	59.7	16.8	9.5	15.3	96.6
2013	2037	61.6	16.8	9.1	12.1	95.0
2014	1786	61.1	17.3	8.4	14.1	90.3
2015	1463	60.3	17.6	7.5	11.1	88.2
2016	1422	60.4	17.9	6.6	9.4	98.9
2017	1336	60.2	18.1	5.5	8.2	99.3
2018	1418	58.5	18.5	4.6	7.1	99.2
2019	1467	58.8	18.8	3.3	4.1	99.2
2020	1335	68.0	18.9	2.0	1.5	99.4 ##
1998-2020	27151	59.8	18.9	14.8	16.9	94.7

27,151 cases diagnosed 1998-2020 are related to a total of 26,077 patients. Currently, in 7,452 (28.6 %) of these 26,077 patients more than one malignancy of any cancer type has been registered. Hereby, groups of 5,384 / 1,436 / 632 (20.6 % / 5.5 % / 2.4 %) patients exist having 2 / 3 / 4+ malignancies.

The increases of incident cases in 2002 and 2007 reflect the expansion to additional registry areas.

Please be aware that data of recent annual patient cohorts may not yet be fully processed. The years under evaluation can be retreived from the respective headings.

How to interpret:
In 2018, a subgroup of 1,418 cases has been diagnosed, of which 18.5 % previously and/or concurrently (synchronously) had at least one other malignancy of any cancer type. In 4.6 % of cases, at least one new malignancy has occurred during the follow-up period (all numbers refer to the date of the database export, see cover sheet).

Table 2

Incidence measures by year of diagnosis
(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.94 m as of 2007, respectively)

Year of diagnosis	Males n	Females n	Males Inc. raw	Fem. Inc. raw	Males Inc. WS	Fem. Inc. WS	Males Inc. ES	Fem. Inc. ES	Males Inc. BRD-S	Fem. Inc. BRD-S
1998	278	300	25.1	25.5	15.4	15.8	22.8	20.6	29.8	23.5
1999	307	323	27.4	27.2	16.6	16.5	24.2	21.8	31.5	24.5
2000	305	347	26.8	28.9	15.9	17.3	23.7	23.0	30.7	26.1
2001	289	380	24.9	31.2	14.4	19.9	21.8	26.1	28.9	29.0
2002	481	566	25.8	28.9	14.7	18.0	21.9	23.6	28.1	26.7
2003	537	651	28.6	33.0	16.3	20.8	23.7	26.8	30.0	29.9
2004	683	902	36.3	45.6	20.1	27.7	29.6	35.8	38.0	40.4
2005	708	981	37.4	49.3	19.9	30.6	29.7	39.2	39.1	43.9
2006	696	1026	36.3	51.1	19.5	33.0	28.6	41.5	36.5	46.5
2007	875	1241	39.5	53.7	20.4	35.7	30.6	43.9	39.7	49.1
2008	869	1446	39.0	62.3	19.8	41.5	29.4	51.0	37.9	56.7
2009	976	1509	43.7	64.9	21.8	44.3	32.5	53.8	42.5	60.0
2010	1133	1699	50.3	72.6	24.2	49.2	36.3	60.1	48.2	66.9
2011	1077	1776	48.1	76.0	22.7	53.7	34.1	64.5	44.9	71.3
2012	1176	1740	51.8	73.7	24.5	48.4	36.8	59.4	47.8	66.6
2013	1272	2037	55.3	85.4	26.0	60.4	38.8	71.9	50.9	79.7
2014	1135	1786	48.7	74.2	21.7	50.4	33.1	60.8	44.1	67.7
2015	962	1463	40.4	60.1	17.9	39.0	27.3	48.6	36.6	54.0
2016	932	1422	38.8	57.9	17.1	37.5	26.0	46.6	34.8	52.0
2017	884	1336	36.6	54.2	16.2	35.2	24.4	43.7	32.6	48.9
2018	1006	1418	41.3	57.1	17.4	36.2	26.8	45.2	36.2	50.9
2019	1030	1467	42.3	59.1	18.1	36.6	27.6	46.4	37.1	52.0
2020	628	1335	25.8	53.8	11.3	35.9	17.0	44.6	22.7	48.8
1998-2020	18239	27151	39.2	56.2	19.2	36.9	28.8	45.7	38.0	51.1

The computation of the incidence measures includes all cancers, irrespective of first or subsequent malignancy.

Table 3

Age distribution parameters by year of diagnosis (ALL PATIENTS)

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	578	62.2	15.1	19.5	98.1	40.5	52.6	63.3	74.3	80.7
1999	630	62.1	15.4	11.8	96.7	39.6	54.1	62.5	73.0	81.4
2000	652	62.8	14.9	22.8	94.0	40.4	54.0	64.2	74.0	80.1
2001	669	61.7	14.8	24.2	93.0	39.6	52.6	62.4	73.2	79.7
2002	1047	62.7	15.0	19.9	95.6	40.8	53.2	64.0	74.0	80.6
2003	1188	61.5	15.3	18.1	95.2	38.2	51.3	63.7	73.0	79.7
2004	1585	62.5	15.9	18.8	96.9	37.8	52.7	64.7	74.4	81.6
2005	1689	62.2	16.5	17.1	99.1	37.0	50.6	64.8	74.7	82.1
2006	1722	61.3	16.3	16.2	97.4	36.8	50.3	64.4	72.8	81.1
2007	2116	61.1	17.5	13.7	96.5	34.1	47.4	65.1	74.0	82.1
2008	2315	60.4	17.7	16.0	100	33.4	46.5	64.7	73.1	82.0
2009	2485	60.2	18.0	15.4	96.5	31.8	45.9	64.2	73.9	81.4
2010	2832	60.8	18.0	17.8	97.7	32.4	47.5	65.0	74.5	81.7
2011	2853	59.4	18.4	18.8	98.6	31.3	44.4	63.3	73.6	81.3
2012	2916	61.6	18.1	12.1	102	32.8	48.0	65.7	75.4	82.7
2013	3309	59.3	19.3	16.0	101	30.5	42.5	63.3	74.9	83.1
2014	2921	60.7	19.2	18.4	101	31.5	44.6	65.6	76.0	83.4
2015	2425	62.1	18.0	19.3	102	33.5	49.3	65.8	76.3	83.0
2016	2354	62.3	17.9	13.2	96.9	34.0	49.9	65.9	76.7	82.7
2017	2220	62.2	17.9	16.1	97.4	34.4	49.5	66.3	77.1	82.5
2018	2424	63.5	17.7	16.5	103	34.9	51.0	67.5	77.8	83.3
2019	2497	63.6	17.4	20.4	101	36.1	51.2	67.0	77.9	83.0
2020	1963	60.1	18.0	18.2	99.8	34.1	45.4	62.1	76.1	81.9
1998–2020	45390	61.4	17.7	11.8	103	33.7	48.5	64.8	75.3	82.2

Table 3a

Age distribution parameters by year of diagnosis (MALES)

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	278	66.2	12.4	28.9	92.2	50.1	57.9	67.7	75.8	82.0
1999	307	65.2	14.2	18.9	94.7	48.3	57.9	65.6	75.6	82.5
2000	305	67.2	12.0	29.8	94.0	51.0	59.9	68.5	75.9	82.8
2001	289	67.5	12.3	25.9	92.9	52.6	60.4	68.3	76.6	82.2
2002	481	67.3	11.7	25.1	93.1	54.0	60.2	67.5	76.0	81.5
2003	537	66.3	12.3	18.1	92.0	49.2	60.0	67.5	75.0	81.0
2004	683	67.4	12.5	23.3	93.9	49.7	60.7	68.7	76.1	82.5
2005	708	68.5	13.0	18.4	99.1	52.5	62.2	70.1	77.3	83.2
2006	696	67.9	12.2	18.3	94.9	51.8	62.0	68.9	76.2	83.0
2007	875	68.9	12.0	13.7	93.9	52.8	62.3	69.9	77.6	83.3
2008	869	68.8	11.8	16.0	97.8	51.4	63.4	69.7	76.9	83.1
2009	976	69.0	12.4	22.8	96.5	52.1	62.3	70.6	77.8	83.0
2010	1133	69.8	11.9	17.8	96.6	53.8	63.6	71.6	78.1	83.3
2011	1077	70.3	11.8	24.8	98.6	53.9	64.3	71.7	78.6	84.0
2012	1176	70.2	11.9	29.5	100	53.4	64.1	71.6	78.1	84.2
2013	1272	70.3	13.0	16.0	101	52.0	63.8	72.6	79.2	85.1
2014	1135	71.5	12.0	19.6	98.5	54.9	66.0	73.4	79.7	85.1
2015	962	71.5	12.5	23.7	102	53.1	65.2	74.4	80.0	85.1
2016	932	71.6	12.0	13.2	95.5	54.9	64.9	74.2	79.6	84.6
2017	884	71.7	11.9	16.1	97.4	54.6	65.7	74.1	80.0	84.3
2018	1006	72.4	11.6	16.5	103	56.9	66.0	74.9	80.1	85.0
2019	1030	71.9	12.0	23.8	101	55.4	64.0	74.8	80.2	84.6
2020	628	71.9	11.5	21.7	99.8	56.5	64.3	73.8	80.1	84.6
1998–2020	18239	69.9	12.3	13.2	103	53.2	63.1	71.7	78.5	83.9

Table 3b

Age distribution parameters by year of diagnosis (FEMALES)

Year of diagnosis	Cases n	Mean	Std. dev.	Min.	Max.	10%	25%	Median 50%	75%	90%
1998	300	58.5	16.4	19.5	98.1	34.8	47.0	59.3	70.8	80.2
1999	323	59.1	16.0	11.8	96.7	35.2	49.3	59.2	71.5	80.2
2000	347	58.8	16.1	22.8	91.8	34.9	46.2	59.5	71.9	79.4
2001	380	57.4	15.1	24.2	93.0	35.8	46.8	57.8	69.1	76.5
2002	566	58.7	16.4	19.9	95.6	35.7	46.8	59.0	71.9	79.7
2003	651	57.6	16.4	20.9	95.2	35.3	44.6	59.2	69.4	78.9
2004	902	58.8	17.1	18.8	96.9	34.1	44.5	61.6	70.9	80.8
2005	981	57.6	17.3	17.1	95.2	33.7	42.5	59.7	70.2	80.8
2006	1026	56.9	17.2	16.2	97.4	32.3	43.0	59.2	69.2	79.8
2007	1241	55.5	18.6	17.7	96.5	29.7	39.2	57.1	70.1	80.4
2008	1446	55.4	18.7	17.7	100	29.4	39.4	56.0	69.7	81.1
2009	1509	54.5	18.7	15.4	95.9	28.9	38.0	55.8	69.1	79.8
2010	1699	54.8	18.9	18.1	97.7	29.0	38.0	55.3	70.2	80.0
2011	1776	52.8	18.5	18.8	97.8	28.8	35.8	51.5	68.4	77.6
2012	1740	55.8	19.3	12.1	102	29.7	38.9	55.7	71.9	81.1
2013	2037	52.4	19.4	17.4	98.3	28.6	34.1	50.7	69.4	79.3
2014	1786	53.8	19.7	18.4	101	29.1	35.4	51.3	71.8	80.5
2015	1463	56.0	18.4	19.3	98.1	31.0	39.5	56.1	71.3	79.7
2016	1422	56.2	18.5	17.7	96.9	30.2	40.7	55.9	72.1	80.4
2017	1336	55.9	18.3	18.7	95.6	30.7	39.7	55.7	72.4	79.9
2018	1418	57.1	18.5	18.6	101	30.6	41.5	57.6	73.1	81.3
2019	1467	57.7	18.1	20.4	98.5	31.8	42.7	57.9	73.4	81.0
2020	1335	54.6	17.8	18.2	96.4	31.8	39.3	53.1	69.7	79.5
1998–2020	27151	55.6	18.4	11.8	102	30.4	39.6	56.1	70.6	80.1

Table 4

Age distribution by 5-year age group and sex for period 2007-2020

Age at diagnosis Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4									
5-9									
10-14	3	0.0	0.0	2	0.0	0.0	1	0.0	0.0
15-19	49	0.1	0.1	9	0.1	0.1	40	0.2	0.2
20-24	515	1.4	1.6	20	0.1	0.2	495	2.3	2.5
25-29	1784	5.0	6.6	42	0.3	0.5	1742	8.0	10.5
30-34	2124	6.0	12.6	70	0.5	1.0	2054	9.5	20.0
35-39	1768	5.0	17.5	127	0.9	1.9	1641	7.6	27.6
40-44	1786	5.0	22.5	243	1.7	3.7	1543	7.1	34.7
45-49	1942	5.5	28.0	400	2.9	6.5	1542	7.1	41.8
50-54	2460	6.9	34.9	648	4.6	11.2	1812	8.4	50.1
55-59	2444	6.9	41.7	914	6.5	17.7	1530	7.1	57.2
60-64	2904	8.2	49.9	1255	9.0	26.7	1649	7.6	64.8
65-69	3917	11.0	60.9	1947	14.0	40.7	1970	9.1	73.9
70-74	4415	12.4	73.3	2571	18.4	59.1	1844	8.5	82.4
75-79	4234	11.9	85.2	2641	18.9	78.0	1593	7.3	89.8
80-84	3042	8.5	93.7	1864	13.4	91.4	1178	5.4	95.2
85+	2243	6.3	100.0	1202	8.6	100.0	1041	4.8	100.0
All ages	35630	100.0		13955	100.0		21675	100.0	

Table 5

Age-specific incidence
for period 2007-2020

Age at diagnosis Years	Males n	Females n	Males Age-spec. incid.	Females Age-spec. incid.
0- 4				
5- 9				
10-14	2	1	0.1	0.1
15-19	9	39	0.5	2.4
20-24	19	490	0.9	25.8
25-29	41	1733	1.8	77.3
30-34	69	2045	3.0	89.7
35-39	125	1627	5.4	71.6
40-44	240	1524	9.6	63.0
45-49	390	1523	14.5	58.5
50-54	633	1795	24.8	71.5
55-59	899	1507	42.4	69.2
60-64	1228	1624	69.5	85.5
65-69	1881	1944	115.2	107.2
70-74	2489	1779	166.0	103.5
75-79	2514	1540	207.8	102.6
80-84	1780	1123	245.8	105.5
85+	1135	981	243.0	94.1
All ages	13454	21275		
Incidence				
Raw			41.3	63.3
WS			19.2	42.5
ES			28.9	52.1
BRD-S			38.1	57.9

The age-specific incidence characterizes the disease risk in a particular age group. The age distribution depends on the patient population frequency in each age group and reflects the tangible clinical picture of everyday patients care (see following chart).

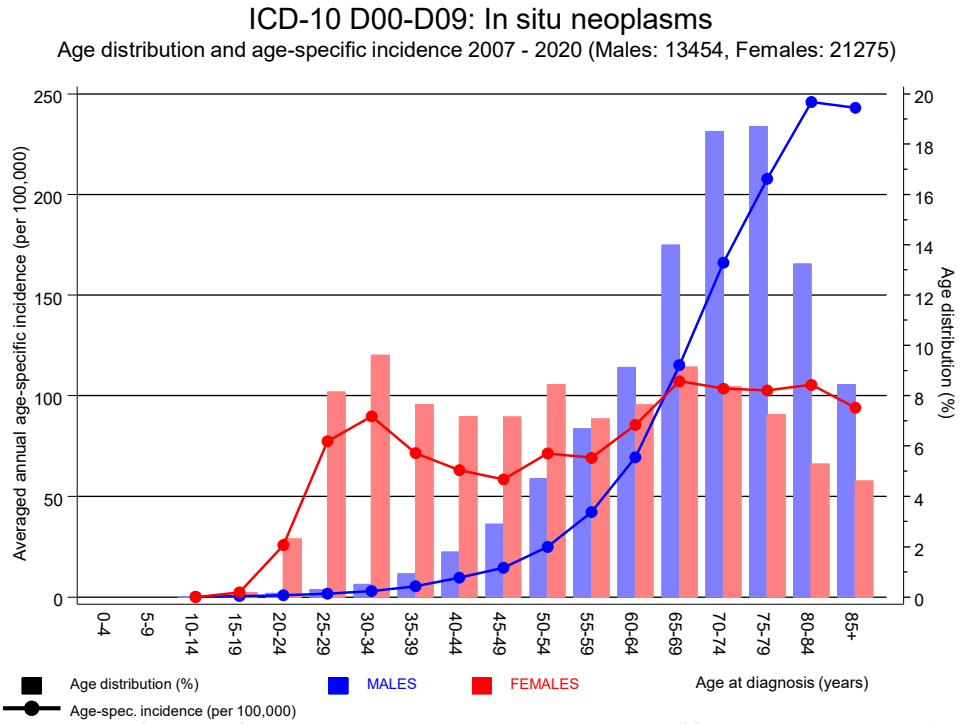

Figure 6. Age distribution (males: mean=70.5 yrs, median=72.4 yrs; females: mean=54.8 yrs, median=54.6 yrs) and age-specific incidence.

Table 7a

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of further malignancies for period 1998–2020

MALES

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C00	Lip	9	1.5	6.0	2.7	11.3	#	1.0	
C03–C06	Oral cavity	41	9.1	4.5	3.2	6.1	#	4.5	4.9
C07–C08	Salivary gland	11	3.5	3.2	1.6	5.6	#	1.1	
C09–C10	Oropharynx	37	10.7	3.4	2.4	4.8	#	3.7	2.7
C12–C13	Hypopharynx	19	5.8	3.3	2.0	5.1	#	1.8	5.3
C15	Oesophagus	72	24.4	2.9	2.3	3.7	#	6.7	4.2
C16	Stomach	109	55.4	2.0	1.6	2.4	#	7.5	2.8
C17	Small intestine	32	8.1	4.0	2.7	5.6	#	3.3	3.1
C18	Colon	313	135.4	2.3	2.1	2.6	#	24.8	4.8
C19–C20	Rectum	157	67.1	2.3	2.0	2.7	#	12.6	
C21	Anus/canal	12	3.1	3.9	2.0	6.8	#	1.2	
C22	Liver	96	37.8	2.5	2.1	3.1	#	8.1	13.5
C23–C24	Bile	35	14.9	2.4	1.6	3.3	#	2.8	22.9
C25	Pancreas	119	55.1	2.2	1.8	2.6	#	8.9	15.1
C32	Larynx	58	11.7	5.0	3.8	6.4	#	6.5	6.9
C33–C34	Lung	463	151.5	3.1	2.8	3.3	#	43.6	9.3
C38,C45	Mesothelioma	16	9.7	1.7	0.9	2.7		0.9	
C43	Malign. melanoma	550	59.8	9.2	8.4	10.0	#	68.5	0.5
C46,C49	Soft tissue	27	8.0	3.4	2.2	4.9	#	2.7	
C50	Breast	12	3.7	3.2	1.7	5.7	#	1.2	
C60	Penis	19	3.5	5.4	3.3	8.4	#	2.2	10.5
C61	Prostate	1166	363.3	3.2	3.0	3.4	#	112.2	4.8
C62	Testis	35	2.5	14.0	9.8	19.5	#	4.5	
C64	Kidney	130	43.4	3.0	2.5	3.6	#	12.1	10.8
C65	Renal pelvis	155	6.3	24.5	20.8	28.7	#	20.8	
C66	Ureter	114	3.8	29.7	24.5	35.7	#	15.4	
C67	Bladder	602	69.9	8.6	7.9	9.3	#	74.4	0.7
C68	Urethra	52	1.4	37.2	27.8	48.7	#	7.1	
C68	Urinary org.	6	1.1	5.3	2.0	11.6	#	0.7	83.3
C70–C72	CNS cancer	34	15.7	2.2	1.5	3.0	#	2.6	5.9
C73	Thyroid	21	7.0	3.0	1.8	4.6	#	2.0	
C76–C79	CUP	51	23.5	2.2	1.6	2.9	#	3.8	
C81	Hodgkin lymphoma	7	2.8	2.5	1.0	5.1		0.6	14.3
C82–C85	NHL	138	58.6	2.4	2.0	2.8	#	11.1	6.5
C90	Mult. myeloma	31	18.1	1.7	1.2	2.4	#	1.8	16.1
C91–C96	Leukaemia	42	22.1	1.9	1.4	2.6	#	2.8	31.0
Others, specified		29	14.3	2.0	1.4	2.9	#	2.1	13.8
Not observed		0	0.8	0.0	0.0	4.7		−0.1	
All further malignancies		4820	1334.5	3.6	3.5	3.7	#	487.3	4.8

Patients	16741
Median age at next malignancy (years)	74.9
Person-years	71530
Mean observation time (years)	4.3
Median observation time (years)	2.8

The occurrence of further specified malignancy is statistically significant.

Further observed malignancies with count 1 to 5 are pooled in category “Others, specified”.

Table 7b

Standardized incidence ratio (SIR, with 95% confidence limits), excess absolute risk (EAR) and DCO rate of further malignancies for period 1998–2020
FEMALES

Diagnosis		Observed n	Expected n	SIR	CI 95%	CI 95%		EAR	DCO %
C03–C06	Oral cavity	19	5.1	3.7	2.2	5.8	#	1.3	
C09–C10	Oropharynx	10	3.7	2.7	1.3	4.9	#	0.6	
C12–C13	Hypopharynx	7	1.0	7.3	2.9	15.0	#	0.6	
C15	Oesophagus	27	5.8	4.7	3.1	6.8	#	2.1	
C16	Stomach	63	27.6	2.3	1.8	2.9	#	3.4	6.3
C17	Small intestine	22	4.8	4.6	2.9	7.0	#	1.7	
C18	Colon	200	79.5	2.5	2.2	2.9	#	11.7	3.5
C19–C20	Rectum	96	32.6	2.9	2.4	3.6	#	6.1	2.1
C21	Anus/canal	46	5.0	9.3	6.8	12.4	#	4.0	
C22	Liver	25	10.5	2.4	1.5	3.5	#	1.4	28.0
C23–C24	Bile	31	11.4	2.7	1.8	3.8	#	1.9	16.1
C25	Pancreas	115	39.1	2.9	2.4	3.5	#	7.3	23.5
C30–C31	Sinuses	7	1.2	5.7	2.3	11.8	#	0.6	
C32	Larynx	10	1.6	6.4	3.1	11.8	#	0.8	
C33–C34	Lung	238	65.1	3.7	3.2	4.2	#	16.7	3.4
C43	Malign. melanoma	334	37.1	9.0	8.1	10.0	#	28.8	
C46,C49	Soft tissue	17	5.1	3.3	1.9	5.3	#	1.2	
C48	Peritoneal	12	3.6	3.3	1.7	5.8	#	0.8	8.3
C50	Breast	1400	278.9	5.0	4.8	5.3	#	108.6	1.1
C51	Vulva	71	9.2	7.7	6.0	9.7	#	6.0	
C52	Vagina	20	1.6	12.5	7.6	19.3	#	1.8	
C53	Cervix uteri	88	14.3	6.2	4.9	7.6	#	7.1	3.4
C54	Corpus uteri	132	46.9	2.8	2.4	3.3	#	8.2	1.5
C55,C57	Fem. genitals un	5	1.7	2.9	0.9	6.7		0.3	40.0
C56	Ovary	111	34.0	3.3	2.7	3.9	#	7.5	4.5
C64	Kidney	58	19.1	3.0	2.3	3.9	#	3.8	8.6
C65	Renal pelvis	60	2.6	23.2	17.7	29.8	#	5.6	
C66	Ureter	40	1.4	28.6	20.5	39.0	#	3.7	
C67	Bladder	151	16.5	9.2	7.8	10.8	#	13.0	2.6
C70–C72	CNS cancer	23	11.3	2.0	1.3	3.1	#	1.1	17.4
C73	Thyroid	29	17.8	1.6	1.1	2.3	#	1.1	
C76–C79	CUP	32	15.2	2.1	1.4	3.0	#	1.6	6.3
C82–C85	NHL	95	33.0	2.9	2.3	3.5	#	6.0	5.3
C90	Mult. myeloma	22	10.0	2.2	1.4	3.3	#	1.2	13.6
C91–C96	Leukaemia	33	12.8	2.6	1.8	3.6	#	2.0	21.2
Others, specified		29	12.8	2.3	1.5	3.2	#	1.6	13.8
Not observed		0	1.2	0.0	0.0	3.0		-0.1	
All further malignancies		3678	880.2	4.2	4.0	4.3	#	271.0	3.3

Patients	25540
Median age at next malignancy (years)	69.8
Person-years	103254
Mean observation time (years)	4.0
Median observation time (years)	2.3

The occurrence of further specified malignancy is statistically significant.

Further observed malignancies with count 1 to 4 are pooled in category “Others, specified”.

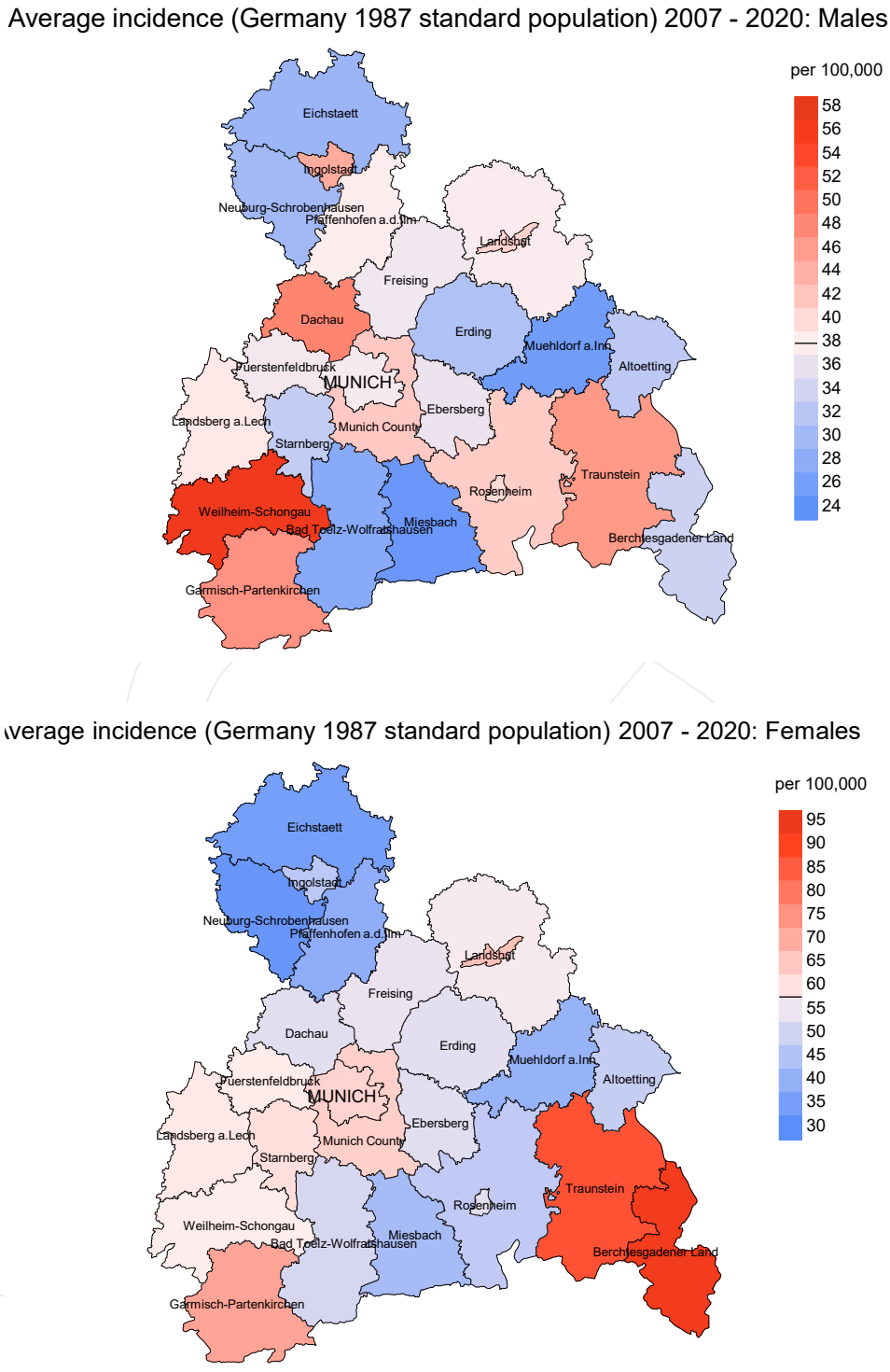

Figure 8a. Map of cancer incidence (german standard population) by county averaged for period 2007 to 2020. According to their individual incidence rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 38.1/100,000 WS N=13,454, females 57.9/100,000 WS N=21,275).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,727 female residents (averaged) in the period from 2007 to 2020 a total of 533 women were identified with newly diagnosed in situ neoplasms. Therefore, the mean incidence rate for this cancer type in this area can be calculated at 53.1/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 47.2 and 59.5/100,000.

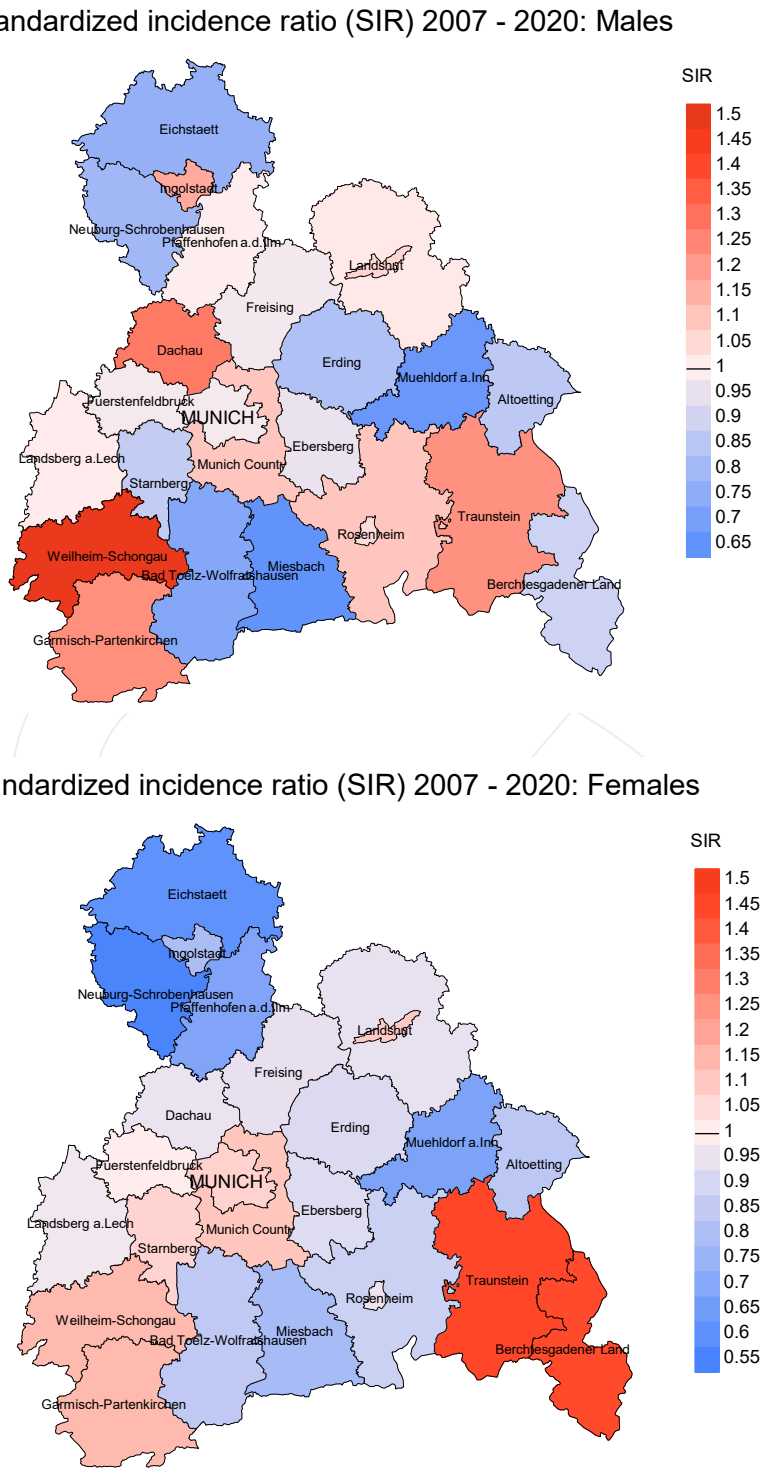

Figure 8b. Map of standardized incidence ratio (SIR) by county averaged for period 2007 to 2020. According to their individual SIR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=13,454, females N=21,275).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,153 female residents (averaged) in the period from 2007 to 2020 a total of 533 women were identified with newly diagnosed in situ neoplasms. Therefore, the mean standardized incidence ratio (SIR) for this cancer type in this area can be calculated at 0.92. Though, the value of this parameter may vary with an underlying probability of 99% between 0.82 and 1.03, and is therefore not statistically striking.

MORTALITY

Table 9a

Annual cohorts: Incident cancers, follow-up status,
and deaths among the annual cohorts

(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.94 m as of 2007, respectively)

Year of diagnosis	Incident cases n	Prop. actively followed %	Deaths n	Prop. deaths %	Prop. deaths with death certific. %
1998	578	95.2	318	55.0	91.8
1999	630	95.7	333	52.9	91.9
2000	652	94.9	339	52.0	91.4
2001	669	94.2	312	46.6	93.6
2002	1047	95.3	520	49.7	92.3
2003	1188	93.9	516	43.4	92.4
2004	1585	94.1	683	43.1	92.4
2005	1689	93.4	683	40.4	93.3
2006	1722	90.0	638	37.0	90.3
2007	2116	87.7	790	37.3	91.8
2008	2315	97.2	746	32.2	90.8
2009	2485	96.5	772	31.1	92.9
2010	2832	96.4	795	28.1	90.3
2011	2853	96.7	703	24.6	90.3
2012	2916	96.9	741	25.4	88.1
2013	3309	95.6	717	21.7	88.7
2014	2921	92.8	680	23.3	87.4
2015	2425	90.4	451	18.6	87.6
2016	2354	98.8	363	15.4	82.9
2017	2220	99.5	304	13.7	78.9
2018	2424	99.1	252	10.4	69.4
2019	2497	99.1	178	7.1	79.2
2020	1963	99.4	74	3.8	90.5
1998–2020	45390	95.6	11908	26.2	89.6

Table 9b

Annual cohorts of incident cancers and deaths,
and cases deceased within the same year of being diagnosed with cancer

(with respect to registry area expansion from 2.65 to 4.10 m as of 2002,
and from 4.10 to 4.94 m as of 2007, respectively)

Year of diagnosis/ death	Incident cases n	Deaths n	Deaths in same year n	Prop. deaths in same year %
1998	578	135	9	1.6
1999	630	153	13	2.1
2000	652	156	10	1.5
2001	669	180	13	1.9
2002	1047	257	16	1.5
2003	1188	305	16	1.3
2004	1585	336	32	2.0
2005	1689	345	30	1.8
2006	1722	387	31	1.8
2007	2116	445	27	1.3
2008	2315	456	32	1.4
2009	2485	505	39	1.6
2010	2832	615	33	1.2
2011	2853	673	51	1.8
2012	2916	718	55	1.9
2013	3309	822	42	1.3
2014	2921	854	61	2.1
2015	2425	924	55	2.3
2016	2354	975	57	2.4
2017	2220	1020	54	2.4
2018	2424	908	36	1.5
2019	2497	951	40	1.6
2020	1963	1140	46	2.3
1998–2020	45390	13260	798	1.8

Table 9c

Annual cohorts of deaths, and proportion of cancer-related and non-cancer-related deaths

(with respect to registry area expansion from 2.65 to 4.10 m as of 2002, and from 4.10 to 4.94 m as of 2007, respectively)

Year of death	Deaths n	Prop. cancer-related %	Prop. non-cancer-related %	Prop. cancer recorded on death certificate %
1998	135	43.0	57.0	59.3
1999	153	37.3	62.7	55.3
2000	156	44.9	55.1	53.8
2001	180	38.9	61.1	54.4
2002	257	47.1	52.9	62.6
2003	305	44.9	55.1	60.9
2004	336	48.5	51.5	62.6
2005	345	53.0	47.0	61.9
2006	387	53.5	46.5	66.8
2007	445	51.7	48.3	65.1
2008	456	48.0	52.0	57.7
2009	505	45.5	54.5	56.5
2010	615	44.2	55.8	57.1
2011	673	45.2	54.8	58.5
2012	718	47.5	52.5	59.4
2013	822	43.6	56.4	55.6
2014	854	46.7	53.3	59.7
2015	924	41.9	58.1	53.7
2016	975	44.5	55.5	54.9
2017	1020	41.7	58.3	52.7
2018	908	29.2	70.8	48.4
2019	951	16.6	83.4	53.2
2020	1140	21.1	78.9	57.6
1998-2020	13260	40.2	59.8	57.1

Table 10a

Medians of age at death according to the grouping in Table 9
MALES

Year of death	Deaths n	Age at death (all causes) Years	Age at death (cancer-related) Years	Age at death (non-cancer-related) Years	Age at death (according to death certificate) Years
1998	86	78.8	81.0	78.2	78.7
1999	80	78.3	78.2	78.3	76.7
2000	99	78.6	73.6	81.0	74.3
2001	113	79.8	75.5	80.8	75.6
2002	172	79.4	76.0	82.5	77.6
2003	184	78.7	74.4	81.1	76.3
2004	191	79.8	77.0	84.1	78.7
2005	197	80.4	78.1	82.2	79.3
2006	229	78.5	76.9	79.7	76.3
2007	277	79.7	78.2	80.7	79.1
2008	276	80.5	78.6	82.1	79.0
2009	300	81.0	78.6	81.8	80.1
2010	371	81.9	78.4	84.4	80.0
2011	408	81.3	79.9	83.2	80.4
2012	465	81.9	80.0	83.6	80.4
2013	500	82.0	78.9	84.6	79.9
2014	541	81.9	79.5	83.6	80.0
2015	522	82.5	79.2	84.8	79.8
2016	568	82.5	80.3	84.2	80.6
2017	606	82.7	80.0	84.5	80.6
2018	546	83.0	80.3	84.4	80.7
2019	563	83.5	80.5	83.9	81.5
2020	674	83.4	81.3	84.0	82.1
1998–2020	7968	81.7	79.1	83.5	79.9

Deaths of patients are considered to be cancer-related, in case that fact was recorded on the death certificate, or patients had suffered from metastasis or recurrence.

Table 10b

Medians of age at death according to the grouping in Table 9
FEMALES

Year of death	Deaths n	Age at death (all causes) Years	Age at death (cancer-related) Years	Age at death (non-cancer-related) Years	Age at death (according to death certificate) Years
1998	49	83.3	75.4	85.7	80.2
1999	73	79.2	76.5	82.6	77.5
2000	57	85.0	79.0	87.0	79.7
2001	67	82.1	76.6	83.5	78.1
2002	85	83.0	76.3	86.3	80.0
2003	121	81.1	66.5	85.4	73.8
2004	145	81.8	72.5	85.1	74.9
2005	148	80.6	76.3	83.4	78.6
2006	158	80.7	76.9	83.1	78.2
2007	168	82.0	78.2	86.3	78.2
2008	180	82.4	76.7	86.7	79.9
2009	205	83.7	74.8	86.9	76.2
2010	244	82.7	76.6	85.9	77.6
2011	265	83.0	76.6	86.5	78.5
2012	253	83.6	77.3	86.8	78.9
2013	322	83.3	75.2	86.6	77.7
2014	313	82.0	75.1	87.3	76.2
2015	402	84.3	78.7	87.1	79.7
2016	407	84.4	77.3	86.9	78.7
2017	414	84.0	78.8	88.4	79.4
2018	362	83.9	77.7	86.5	78.9
2019	388	83.3	80.3	83.8	79.7
2020	466	84.7	79.5	85.3	81.7
1998–2020	5292	83.2	77.0	85.9	78.7

By 2018, Bavarians' life expectancy at birth is estimated at 79.3 years for boys and 83.8 years for girls.

Deaths of patients are considered to be cancer-related, in case that fact was recorded on the death certificate, or patients had suffered from metastasis or recurrence.

Table 11a

Mortality measures (cancer-related death) and mortality-incidence-index
by year of death
MALES

Year of death	Deaths n	Mort. raw	MI-Index raw	Mort. WS	MI-Index WS	Mort. ES	MI-Index ES	Mort. BRD-S	MI-Index BRD-S
1998	36	3.2	0.13	1.8	0.12	3.1	0.14	4.6	0.15
1999	28	2.5	0.09	1.3	0.08	2.3	0.10	3.3	0.11
2000	49	4.3	0.16	2.5	0.16	3.9	0.17	5.7	0.19
2001	44	3.8	0.15	2.0	0.14	3.4	0.16	4.8	0.17
2002	86	4.6	0.18	2.4	0.16	4.0	0.18	5.7	0.20
2003	82	4.4	0.15	2.2	0.14	3.6	0.16	5.1	0.17
2004	97	5.2	0.14	2.4	0.12	4.1	0.14	6.0	0.16
2005	104	5.5	0.15	2.4	0.12	4.2	0.14	6.4	0.17
2006	127	6.6	0.19	2.9	0.15	4.9	0.18	7.6	0.21
2007	136	6.1	0.16	2.7	0.14	4.6	0.16	6.7	0.17
2008	137	6.2	0.16	2.5	0.13	4.3	0.15	6.7	0.18
2009	138	6.2	0.15	2.6	0.12	4.3	0.14	6.3	0.15
2010	161	7.1	0.15	2.8	0.12	4.8	0.14	7.1	0.15
2011	190	8.5	0.18	3.3	0.15	5.7	0.17	8.2	0.19
2012	238	10.5	0.21	3.9	0.16	6.7	0.19	10.1	0.22
2013	216	9.4	0.18	3.5	0.14	5.9	0.16	8.8	0.18
2014	260	11.2	0.24	4.0	0.19	6.9	0.22	10.0	0.23
2015	237	10.0	0.26	3.5	0.21	6.1	0.23	8.9	0.25
2016	273	11.4	0.31	3.9	0.23	6.8	0.27	9.9	0.30
2017	256	10.6	0.30	3.7	0.24	6.3	0.27	9.2	0.29
2018	162	6.7	0.17	2.2	0.13	3.8	0.15	5.6	0.16
2019	99	4.1	0.10	1.3	0.08	2.3	0.09	3.4	0.10
2020	158	6.5	0.27	2.2	0.21	3.8	0.24	5.4	0.26
1998-2020	3314	7.1	0.19	2.8	0.15	4.9	0.17	7.1	0.19

Table 11b

Mortality measures (cancer-related death) and mortality-incidence-index
by year of death
FEMALES

Year of death	Deaths n	Mort. raw	MI-Index raw	Mort. WS	MI-Index WS	Mort. ES	MI-Index ES	Mort. BRD-S	MI-Index BRD-S
1998	22	1.9	0.07	0.8	0.05	1.2	0.06	1.5	0.07
1999	29	2.4	0.09	1.0	0.06	1.5	0.07	1.9	0.08
2000	21	1.7	0.06	0.6	0.03	1.0	0.04	1.3	0.05
2001	27	2.2	0.07	0.8	0.04	1.3	0.05	1.7	0.06
2002	35	1.8	0.06	0.7	0.04	1.1	0.05	1.4	0.05
2003	55	2.8	0.08	1.3	0.06	1.8	0.07	2.2	0.08
2004	66	3.3	0.07	1.4	0.05	2.1	0.06	2.6	0.06
2005	79	4.0	0.08	1.5	0.05	2.3	0.06	3.0	0.07
2006	80	4.0	0.08	1.5	0.05	2.3	0.06	3.0	0.07
2007	94	4.1	0.08	1.4	0.04	2.3	0.05	3.2	0.06
2008	83	3.6	0.06	1.3	0.03	2.0	0.04	2.6	0.05
2009	92	4.0	0.06	1.5	0.04	2.4	0.04	3.1	0.05
2010	112	4.8	0.07	1.7	0.04	2.7	0.04	3.6	0.05
2011	115	4.9	0.07	1.7	0.03	2.6	0.04	3.5	0.05
2012	103	4.4	0.06	1.6	0.03	2.5	0.04	3.3	0.05
2013	142	6.0	0.07	2.2	0.04	3.3	0.05	4.3	0.05
2014	140	5.8	0.08	2.1	0.04	3.2	0.05	4.3	0.06
2015	154	6.3	0.11	2.1	0.06	3.3	0.07	4.4	0.08
2016	163	6.6	0.12	2.2	0.06	3.5	0.08	4.5	0.09
2017	171	6.9	0.13	2.2	0.06	3.4	0.08	4.7	0.10
2018	107	4.3	0.08	1.5	0.04	2.3	0.05	3.0	0.06
2019	59	2.4	0.04	0.7	0.02	1.1	0.02	1.6	0.03
2020	88	3.5	0.07	1.1	0.03	1.8	0.04	2.3	0.05
1998-2020	2037	4.2	0.08	1.5	0.04	2.3	0.05	3.1	0.06

Table 12

Age distribution of age at death (cancer-related) for period 2007-2020
(**incl. multiple malignancies**)

Age at death Years	Cases n	%	Cum.%	Males n	%	Cum.%	Females n	%	Cum.%
0-4									
5-9									
10-14									
15-19									
20-24									
25-29	2	0.0	0.0			0.0	2	0.1	0.1
30-34	4	0.1	0.1			0.0	4	0.2	0.4
35-39	9	0.2	0.4	1	0.0	0.0	8	0.5	0.9
40-44	21	0.5	0.8	1	0.0	0.1	20	1.2	2.1
45-49	45	1.1	1.9	11	0.4	0.5	34	2.1	4.2
50-54	81	1.9	3.8	22	0.8	1.3	59	3.6	7.8
55-59	138	3.2	7.0	50	1.9	3.2	88	5.4	13.2
60-64	213	5.0	12.0	115	4.3	7.5	98	6.0	19.3
65-69	383	8.9	20.9	231	8.7	16.2	152	9.4	28.7
70-74	643	15.0	35.9	404	15.2	31.4	239	14.7	43.4
75-79	805	18.8	54.7	542	20.4	51.7	263	16.2	59.6
80-84	823	19.2	73.9	554	20.8	72.6	269	16.6	76.2
85+	1117	26.1	100.0	730	27.4	100.0	387	23.8	100.0
All ages	4284	100.0		2661	100.0		1623	100.0	

Table 13

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2020
(**incl. multiple malignancies**)

Age at death Years	Males n	Females n	Males Age-spec. mortal.	MI-index	Females Age-spec. mortal.	MI-index
0- 4						
5- 9						
10-14						
15-19						
20-24						
25-29		2			0.1	0.00
30-34		4			0.2	0.00
35-39	1	8	0.0	0.01	0.4	0.00
40-44	1	20	0.0	0.00	0.8	0.01
45-49	11	34	0.4	0.03	1.3	0.02
50-54	22	59	0.9	0.03	2.3	0.03
55-59	50	88	2.4	0.06	4.0	0.06
60-64	115	98	6.5	0.09	5.2	0.06
65-69	231	152	14.2	0.12	8.4	0.08
70-74	404	239	26.9	0.16	13.9	0.13
75-79	542	263	44.8	0.22	17.5	0.17
80-84	554	269	76.5	0.31	25.3	0.24
85+	730	387	156.3	0.64	37.1	0.39
All ages	2661	1623				
Mortality						
Raw			8.2	0.20	4.8	0.08
WS			3.0	0.16	1.7	0.04
ES			5.2	0.18	2.6	0.05
BRD-S			7.6	0.20	3.4	0.06
PYLL-70						
per 100,000			9.6		17.9	
ES			8.1		14.9	
AYLL-70			6.4		10.9	

Table 14a

Further malignancies in deaths in period 1998–2020
MALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C03–C06	Oral cavity	34	0.8	9	26.5	3	8.8	22	64.7
C07–C08	Salivary gland	8	0.2	1	12.5	1	12.5	6	75.0
C09–C10	Oropharynx	46	1.1	17	37.0	12	26.1	17	37.0
C12–C13	Hypopharynx	25	0.6	6	24.0	3	12.0	16	64.0
C15	Oesophagus	67	1.6	13	19.4	4	6.0	50	74.6
C16	Stomach	113	2.8	35	31.0	14	12.4	64	56.6
C17	Small intestine	23	0.6	5	21.7	6	26.1	12	52.2
C18	Colon	246	6.0	84	34.1	36	14.6	126	51.2
C19–C20	Rectum	141	3.4	60	42.6	25	17.7	56	39.7
C22	Liver	87	2.1	7	8.0	8	9.2	72	82.8
C23–C24	Bile	34	0.8	1	2.9	5	14.7	28	82.4
C25	Pancreas	118	2.9	11	9.3	10	8.5	97	82.2
C32	Larynx	43	1.0	19	44.2	6	14.0	18	41.9
C33–C34	Lung	487	11.9	58	11.9	27	5.5	402	82.5
C38,C45	Mesothelioma	19	0.5	2	10.5			17	89.5
C43	Malign. melanoma	159	3.9	36	22.6	45	28.3	78	49.1
C44	Skin others	434	10.6	40	9.2	71	16.4	323	74.4
C46,C49	Soft tissue	15	0.4	6	40.0			9	60.0
C50	Breast	8	0.2	3	37.5			5	62.5
C60	Penis	8	0.2	3	37.5	1	12.5	4	50.0
C61	Prostate	750	18.3	323	43.1	123	16.4	304	40.5
C64	Kidney	114	2.8	57	50.0	11	9.6	46	40.4
C65	Renal pelvis	131	3.2	38	29.0	30	22.9	63	48.1
C66	Ureter	96	2.3	26	27.1	22	22.9	48	50.0
C67	Bladder	449	10.9	111	24.7	55	12.2	283	63.0
C68	Urethra	24	0.6	2	8.3	5	20.8	17	70.8
C68	Urinary org.	8	0.2					8	100.0
C70–C72	CNS cancer	42	1.0	7	16.7			35	83.3
C73	Thyroid	16	0.4	8	50.0	1	6.3	7	43.8
C76–C79	CUP	60	1.5	3	5.0	13	21.7	44	73.3
C81	Hodgkin lymphoma	12	0.3	6	50.0			6	50.0
C82–C85	NHL	158	3.8	71	44.9	7	4.4	80	50.6
C90	Mult. myeloma	33	0.8	11	33.3	3	9.1	19	57.6
C91–C96	Leukaemia	50	1.2	5	10.0	3	6.0	42	84.0
Others, specified		46	1.1	18	39.1	3	6.5	25	54.3
All further malignancies		4104	100.0	1102	26.9	553	13.5	2449	59.7

Further malignancies with number of cases 1 to 7 are pooled in category “Others, specified”.

ICD-10 C44 (Other malignant neoplasms of skin) is not systematically recorded by MCR and therefore not considered for evaluation as a particular primary but at least as a further malignancy.

Table 14b

Further malignancies in deaths in period 1998–2020
FEMALES

Diagnosis		Total n	Total %↓	Pre n	Pre ←%	Syn-chron ±30d n	Syn-chron ±30d ←%	Post n	Post ←%
C03–C06	Oral cavity	15	0.7	4	26.7	1	6.7	10	66.7
C09–C10	Oropharynx	8	0.4	3	37.5			5	62.5
C12–C13	Hypopharynx	7	0.3	4	57.1	1	14.3	2	28.6
C15	Oesophagus	18	0.8	4	22.2	3	16.7	11	61.1
C16	Stomach	49	2.3	9	18.4	6	12.2	34	69.4
C17	Small intestine	12	0.6	2	16.7	2	16.7	8	66.7
C18	Colon	124	5.8	29	23.4	14	11.3	81	65.3
C19–C20	Rectum	66	3.1	16	24.2	12	18.2	38	57.6
C21	Anus/canal	17	0.8	6	35.3	3	17.6	8	47.1
C22	Liver	24	1.1	3	12.5	4	16.7	17	70.8
C23–C24	Bile	28	1.3	4	14.3	3	10.7	21	75.0
C25	Pancreas	101	4.7	4	4.0	7	6.9	90	89.1
C33–C34	Lung	215	10.1	18	8.4	19	8.8	178	82.8
C43	Malign. melanoma	68	3.2	23	33.8	10	14.7	35	51.5
C44	Skin others	164	7.7	19	11.6	29	17.7	116	70.7
C46,C49	Soft tissue	15	0.7	5	33.3	1	6.7	9	60.0
C48	Peritoneal	9	0.4	1	11.1	2	22.2	6	66.7
C50	Breast	446	20.9	153	34.3	39	8.7	254	57.0
C51	Vulva	30	1.4	11	36.7	2	6.7	17	56.7
C52	Vagina	19	0.9	6	31.6	1	5.3	12	63.2
C53	Cervix uteri	56	2.6	27	48.2	11	19.6	18	32.1
C54	Corpus uteri	70	3.3	41	58.6	3	4.3	26	37.1
C56	Ovary	85	4.0	22	25.9	11	12.9	52	61.2
C64	Kidney	33	1.5	12	36.4	3	9.1	18	54.5
C65	Renal pelvis	56	2.6	23	41.1	12	21.4	21	37.5
C66	Ureter	33	1.5	10	30.3	14	42.4	9	27.3
C67	Bladder	114	5.3	20	17.5	10	8.8	84	73.7
C70–C72	CNS cancer	20	0.9	3	15.0			17	85.0
C73	Thyroid	16	0.7	9	56.3			7	43.8
C76–C79	CUP	33	1.5	4	12.1	8	24.2	21	63.6
C81	Hodgkin lymphoma	9	0.4	8	88.9			1	11.1
C82–C85	NHL	78	3.6	37	47.4	4	5.1	37	47.4
C90	Mult. myeloma	25	1.2	5	20.0	3	12.0	17	68.0
C91–C96	Leukaemia	35	1.6	5	14.3			30	85.7
Others, specified		40	1.9	10	25.0	3	7.5	27	67.5
All further malignancies		2138	100.0	560	26.2	241	11.3	1337	62.5

Further malignancies with number of cases 1 to 6 are pooled in category “Others, specified”.

ICD-10 C44 (Other malignant neoplasms of skin) is not systematically recorded by MCR and therefore not considered for evaluation as a particular primary but at least as a further malignancy.

Table 15

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2020
(**First primaries only** *)

Age at death Years	Males n	Females n	Males Age-spec. mortal.	MI-index	Females Age-spec. mortal.	MI-index
0- 4						
5- 9						
10-14						
15-19						
20-24						
25-29						
30-34		2			0.1	0.00
35-39	1	2	0.0	0.01	0.1	0.00
40-44		9			0.4	0.01
45-49	7	18	0.3	0.02	0.7	0.01
50-54	9	27	0.4	0.02	1.1	0.02
55-59	19	49	0.9	0.03	2.2	0.04
60-64	55	50	3.1	0.06	2.6	0.04
65-69	117	68	7.2	0.10	3.8	0.05
70-74	187	117	12.5	0.13	6.8	0.10
75-79	279	139	23.1	0.21	9.3	0.15
80-84	305	130	42.1	0.35	12.2	0.20
85+	412	229	88.2	0.78	22.0	0.41
All ages	1391	840				
Mortality						
Raw			4.3	0.17	2.5	0.05
WS			1.5	0.12	0.8	0.02
ES			2.7	0.15	1.3	0.03
BRD-S			4.0	0.17	1.8	0.04
PYLL-70						
per 100,000			4.5		8.6	
ES			3.8		7.1	
AYLL-70			6.2		10.8	

* See corresponding tables with multiple malignancies.

Table 16

Age-specific mortality (cancer-related) and proportion of all cancers
for period 2007-2020
(**Single primaries only** *)

Age at death Years	Males n	Females n	Males Age-spec. mortal.	Males MI-index	Females Age-spec. mortal.	Females MI-index
0- 4						
5- 9						
10-14						
15-19						
20-24						
25-29						
30-34		1			0.0	0.00
35-39	1		0.0	0.01		
40-44		3			0.1	0.00
45-49	3	2	0.1	0.01	0.1	0.00
50-54	4	7	0.2	0.01	0.3	0.01
55-59	6	6	0.3	0.01	0.3	0.01
60-64	13	12	0.7	0.02	0.6	0.01
65-69	29	9	1.8	0.03	0.5	0.01
70-74	37	24	2.5	0.03	1.4	0.03
75-79	56	30	4.6	0.06	2.0	0.04
80-84	111	35	15.3	0.17	3.3	0.07
85+	149	99	31.9	0.35	9.5	0.21
All ages	409	228				
Mortality						
Raw			1.3	0.06	0.7	0.01
WS			0.4	0.04	0.2	0.01
ES			0.8	0.05	0.3	0.01
BRD-S			1.2	0.06	0.4	0.01
PYLL-70						
per 100,000			1.4		1.7	
ES			1.2		1.4	
AYLL-70			7.4		11.9	

* See corresponding tables with multiple malignancies.

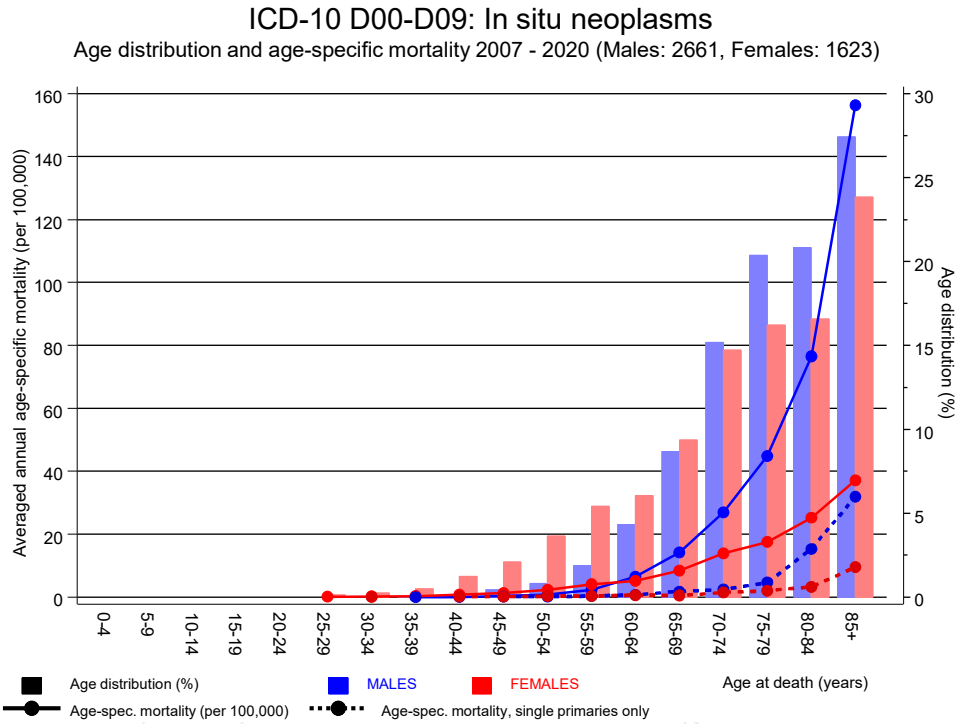

Figure 17. Distribution of age at death (bars; males: mean=72.6 yrs, median=73.3 yrs; females: mean=67.9 yrs, median=70.2 yrs) and age-specific mortality (all patients: solid line, patients with single primaries: dotted line).

The difference between age at diagnosis (Table 3) and age at in situ neoplasms-related death (see Table 10) should be considered.

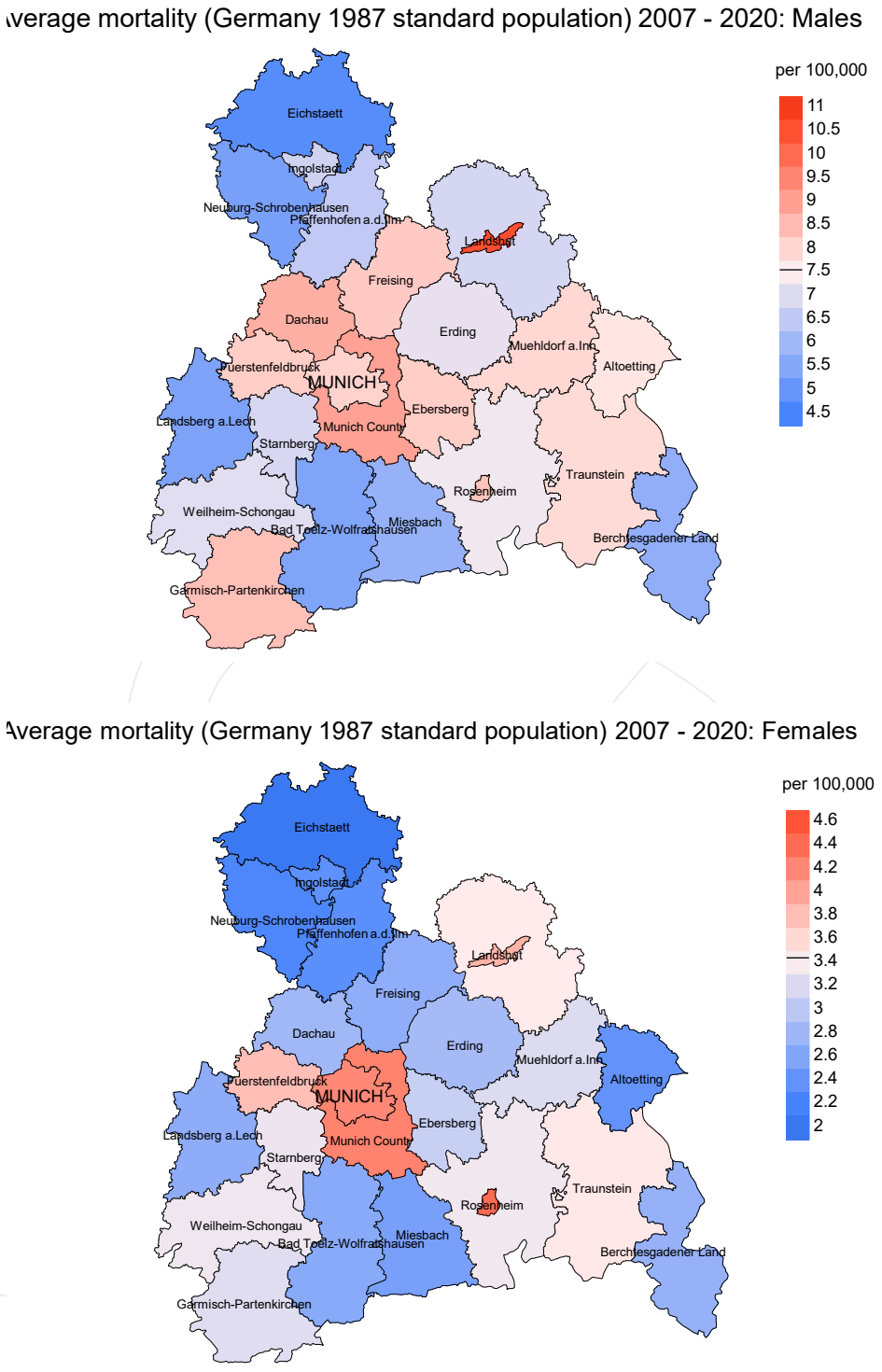

Figure 18a. Map of cancer mortality (german standard population) by county averaged for period 2007 to 2020. According to their individual mortality rates, the counties are displayed in different red and blue hues, being the fine white color attributed to the population mean (males 7.6/100,000 WS N=2,661, females 3.4/100,000 WS N=1,623).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,727 female residents (averaged) in the period from 2007 to 2020 a total of 38 women died from in situ neoplasms. Therefore, the mean mortality rate for this cancer type in this area can be calculated at 3.1/100,000 (german standard population). Though, the value of this parameter may vary with an underlying probability of 99% between 1.9 and 4.7/100,000.

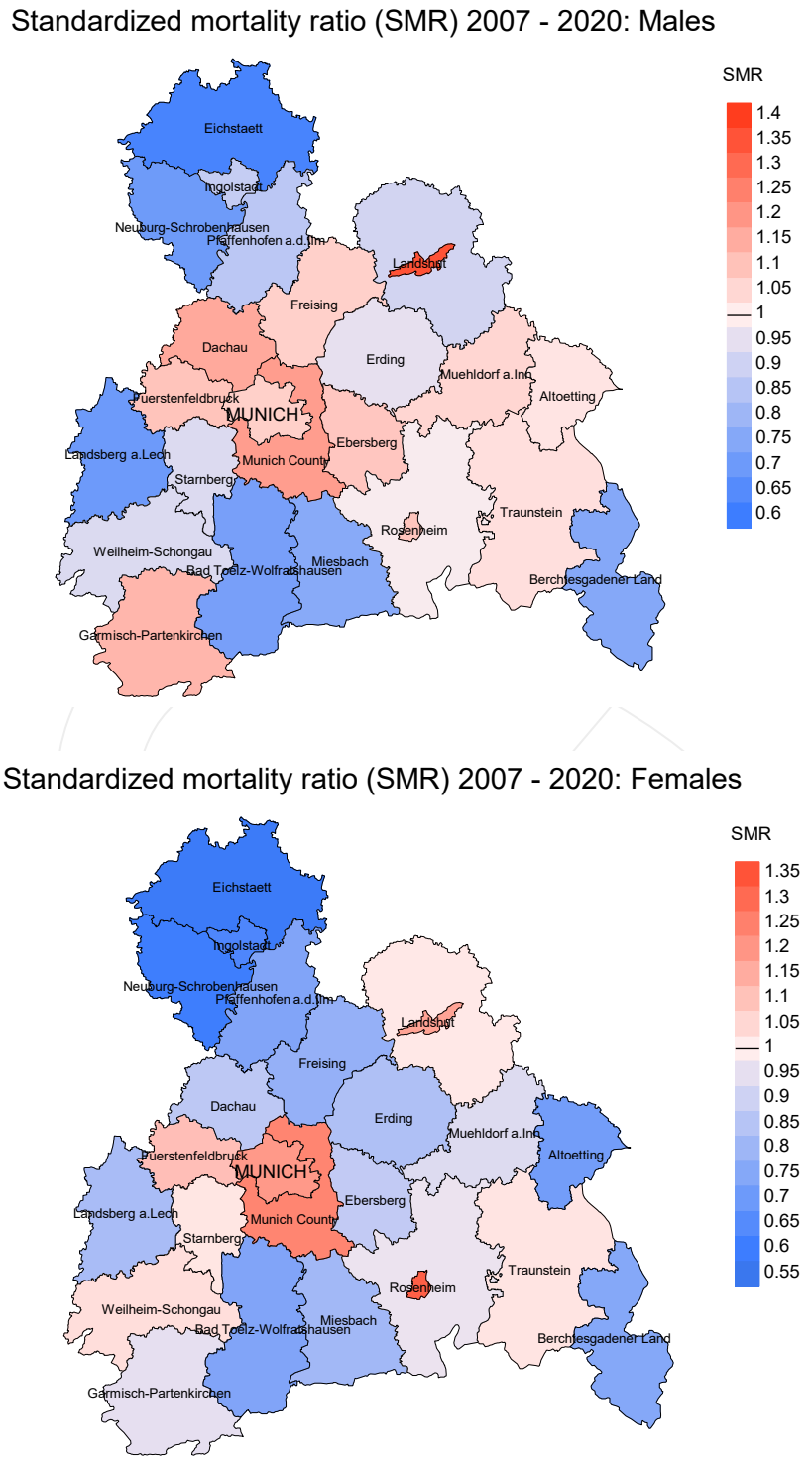

Figure 18b. Map of standardized mortality ratio (SMR) by county averaged for period 2007 to 2020. According to their individual SMR values, the counties are displayed in different red and blue hues, being the fine white color attributed to the population overall of 1.0 (males N=2,661, females N=1,623).

The results should be interpreted with caution! E.g., in county Ebersberg with a population of 67,153 female residents (averaged) in the period from 2007 to 2020 a total of 38 women died from in situ neoplasms. Therefore, the mean standardized mortality ratio (SMR) for this cancer type in this area can be calculated at 0.87. Though, the value of this parameter may vary with an underlying probability of 99% between 0.55 and 1.31, and is therefore not statistically striking.

Statistical Notes

In all tables and figures the respective reference values should be carefully considered. The incidence rates include diagnoses (with multiple primary), and death certificate only (DCO) cases, where applicable. For mortality statistics patients, diagnoses and progressive course of disease are presented. In the calculations, all courses of disease are considered whereby progressions occurred and/or death certificate identified progressive cancers were ascertained. Additionally there are three groups of disease course to consider:

1. **All multiple primaries included**

   The mortality statistic describes the tumor-specific death, independent of any malignancy. The patient perspective, induced secondary malignancies, and the problem of multiple malignancies from the same primary tumor all have reasons for their inclusion.

2. **First singular primary** (no information about other prior or synchronous malignancy)

   The mortality statistic describes the cancer-related death for patients who have no therapeutic restrictions due to a previous or synchronous cancer. These statistics are comparable to studies that have exclusion criteria based on a second malignancy.

3. **Single primary** (no information about other prior, syn- or metachronous malignancy)

   The mortality statistic describes the tumor-specific death that occurs without any impact through secondary primaries, earlier, synchronous, later or induced. Precisely the difference between disease group 1 and 2 highlight the magnitude of the problem of secondary malignancies.

For this reason differences appear concerning official mono-causal mortality statistics. To judge the maximum deviation, 2 further tables are presented. In the first table the distribution of secondary malignancies before, at or after the described cancer are shown, that could be an alternative cause of death. In the second table, the age-specific mortality rates for all courses of disease, without designation of secondary malignancies are shown.

A previously minimally acknowledged statistic is the **age at death**, which allows for a good assessment of the quality of classification of the apparent tumor-specific death. For assumed tumor-independent deaths, the age of death should be estimated from the age of diagnosis and the normal life expectancy, whereas tumor-dependent deaths can be estimated from the age of diagnosis plus the average tumor-specific life expectancy. The comparison of different tumors demonstrates this association, if the causes of cancer and the competing cause of death are independent of each other (e.g. breast and colon versus head&neck and lung).

The ratio of mortality and incidence (mortality-to-incidence ratio, **MIR**, **MI-Index**) is a statistical index that allows for the evaluation of the quality of data. For diseases with poor prognoses, comparable values are obtained from all age groups, because to a large extent, the numerator and denominator contain the same cases. For tumors with a good prognosis, increasing and decreasing incidence and age-specific differences in prognosis can more strongly alter the MIR. Additionally, attention should be paid to the confidence intervals where fewer cases are reported.

The complexity of problems identified here emphasizes the importance of relative survival data for the appropriate analysis of long term results.

As a measurement of the burden of disease, the number of potential life years loss due to premature deaths in a cohort can be calculated (**PYLL**, potential years of life lost, standardized per 100,000 persons or per European standard) as well as the average loss of life years per individual (**AYLL**, average years of life lost). Depending upon the analytic aim (health economy, prevention, health care research) different methods exist for the generation of these measurements. In the results presented here, the age for a premature death is considered to be before 70 years, according to the guidelines of the OECD and the WHO (as seen in the abbreviation PYLL-70 or AYLL-70).

Shortcuts

MCR	Munich Cancer Registry (Tumorregister München)
GEKID	Association of Population-based Cancer Registries in Germany (Gesellschaft der epidemiologischen Krebsregister in Deutschland e.V.)
SEER	Surveillance, Epidemiology, and End Results (USA)
DCO	Death certificate only
BRD-S	German (FRG) standard population
ES	European standard population (old)
WS	World standard population
SIR	Standardized incidence ratio
CI	Confidence interval
EAR	Excess absolute risk = excess cancer cases (O - E) per 10,000 person-years
PYLL-70	Potential years of life lost prior to age 70 given a person dies before that age
AYLL-70	Average years of life lost prior to age 70 given a person dies before that age
SMR	Standardized mortality ratio
MI-index	Ratio of mortality to incidence, MIR
FRG	Federal Republic of Germany

Recommended Citation

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